

WHAT IS CLAIMED IS:

1. An internal combustion engine comprising:
 - a crankcase;
 - a pump supported by the crankcase, the pump including an inlet and a first outlet;
 - 5 a first camshaft having a first channel extending between first and second ends of the first camshaft, wherein the first camshaft end is supported at least indirectly by one of the pump and the crankcase, and wherein lubricant is provided from the pump to the first channel at the first end and communicated by way of the first channel to the second end;
 - a crankshaft supported by the crankcase;
 - 10 a second channel communicating at least a first portion of the lubricant delivered to the second end of the first camshaft by way of the first channel to a first crankshaft bearing of the crankshaft; and
 - 15 a third channel within the crankshaft that receives at least a second portion of the lubricant communicated by the second channel and further communicates at least a third portion of the second portion of the lubricant to a crankpin bearing on the crankshaft.
2. The internal combustion engine of claim 1, wherein one of the pump and a floor of the crankcase forms a first camshaft bearing for supporting the first camshaft end, wherein the lubricant also lubricates the first camshaft bearing.
- 5 3. The internal combustion engine of claim 1, wherein the third channel within the crankshaft includes at least a first channel portion extending from the first crankshaft bearing to an interior of a crankpin of the

5 crankshaft, and a second channel portion extending from the first channel portion to an outer surface of the crankpin, wherein the outer surface serves as the crankpin bearing.

4. The internal combustion engine of claim 3, wherein the first channel portion is a bore extending at a first oblique angle relative to a central axis of the crankshaft between the first crankshaft bearing and the interior of the crankpin, and the second channel portion includes both a third channel portion that extends within the interior of the crankpin along a direction that is substantially parallel to the central axis and a fourth channel portion that extends from the third channel portion to the outer surface.

5 10 5. The internal combustion engine of claim 4, wherein the third channel further includes a fifth channel portion that is a bore extending at a second oblique angle relative to the central axis of the crankshaft between a second crankshaft bearing and the third channel portion, wherein at least some of the lubricant provided to the first channel portion at the first crankshaft bearing is communicated to the second crankshaft bearing.

6. The internal combustion engine of claim 1, further comprising:

5 a fourth channel communicating lubricant from the pump to a second crankshaft bearing.

5 7. The internal combustion engine of claim 6, wherein the crankshaft further includes a fifth channel that receives at least a first portion of the lubricant communicated by the fourth channel to the second crankshaft bearing, and further communicates at least a second portion of the first portion of the lubricant

communicated by the fourth channel to the crankpin bearing on the crankshaft, so that lubricant flow is provided bidirectionally to the crankshaft.

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8. The internal combustion engine of claim 1, wherein the crankshaft includes a first eccentric bearing intended to support at least one balance weight component, and

5 wherein the crankshaft includes a fourth channel coupling the third channel to an outer surface of the first eccentric bearing to communicate lubricant thereto.

5 9. The internal combustion engine of claim 8, wherein the third channel and the fourth channel communicate the lubricant to portions of the outer surfaces of the crankpin bearing and the eccentric bearing that are in between other portions of those outer surfaces that are

farthest from and closest to a central axis of the crankshaft.

10. The internal combustion engine of claim 8, wherein the third channel extends beyond the crankpin bearing to a fifth channel coupling the third channel to an outer surface of a second eccentric bearing to communicate lubricant thereto, wherein the second eccentric bearing also is for supporting the at least one balance weight component, and wherein each of the first and second eccentric bearings are respectively positioned adjacent to a respective counterweight of the crankshaft.

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11. The internal combustion engine of claim 1, wherein the crankcase includes a main portion including the floor and a plurality of sides, and further includes a top portion that is detachable from the main portion, wherein the top is molded so that an inner surface of the top

includes a plurality of indentations that, when covered with a panel, form at least one channel, wherein the at least one channel includes at least a part of the second channel.

12. The internal combustion engine of claim 1, further comprising an oil filter coupled at least indirectly in between the second end of the first camshaft and the second channel, wherein the lubricant provided to the crankshaft is filtered.

5 13. A system comprising:

a pump capable of supplying lubricant;
a first passage at least partially linking the pump to a crankshaft bearing so that at least a first portion of the lubricant supplied by the pump is communicated to the crankshaft bearing; and

10 a crankshaft supported with respect to the crankshaft bearing, wherein the crankshaft includes a first eccentric bearing, wherein the first eccentric bearing is configured to support at least one balance weight component; and

15 a second passage within the crankshaft, wherein the second passage is provided with at least a second portion of the lubricant by way of the crankshaft bearing and communicates at least a third portion of the lubricant to a first outer surface of the first eccentric bearing.

14. The system of claim 13, wherein the crankshaft further includes a second eccentric bearing, wherein the second eccentric bearing also is configured to support the at least one balance weight component, and wherein

5 the second passage within the crankshaft also
communicates at least a fourth portion of the lubricant
to a second outer surface of the second eccentric
bearing.

15. The system of claim 12,
 wherein the second passage includes first and second
oblique bores, a crankpin bore, and first and second
additional bores coupling the first and second oblique
bores to the first and second outer surfaces,
5 respectively,

 wherein the crankpin bore extends within an interior
of a crankpin of the crankshaft, and wherein the first
and second oblique bores couple the crankpin bore with
10 first and second annular grooves formed within first and
second crankshaft bearing portions at first and second
ends of the crankshaft.

16. The system of claim 13, wherein the second passage
communicates the at least third portion of the lubricant
to a location on the outer surface of the eccentric
bearing that is intermediate a first portion of the outer
5 surface that is a maximum distance from a central axis of
the crankshaft and a second portion of the outer surface
that is a minimum distance from the central axis.

17. The system of claim 13, wherein the crankshaft
further includes a crankpin bearing configured to
interface a connecting rod, and wherein the second
passage within the crankshaft also communicates at least
5 a fourth portion of the lubricant to a second outer
surface of the crank bearing.

18. The system of claim 13, wherein the second passage
is formed at least in part by way of affixing a flange
onto a main crankshaft portion, wherein one of the flange
and the main crankshaft portion includes a groove so
that, upon the affixing of the flange upon the main
crankshaft portion, an internal channel is created.

5 19. A single-cylinder internal combustion engine
comprising:

a cylinder;

a crankcase;

5 a first camshaft supported at least indirectly by
the crankcase, wherein the first camshaft includes a
first cam;

10 a second camshaft supported at least indirectly by
the crankcase, wherein the second camshaft includes a
second cam;

15 a crankshaft supported at least indirectly by the
crankcase, wherein the crankshaft is at least indirectly
coupled to each of the first and second camshafts so that
rotation of the crankshaft causes rotation of each of the
first and second camshafts and their respective cams,
wherein rotation of the respective cams is capable of
producing corresponding movement of first and second
valves associated with the cylinder, respectively; and

20 means for communicating lubricant to at least one
bearing associated with the crankshaft.

20. The single-cylinder engine of claim 19, wherein the
means for communicating lubricant includes at least first
and second channels wherein the first channel is formed
internally within one of the first and second camshafts,
and the second channel is at least partly molded within a
5 removable top portion of the crankcase.

21. The single-cylinder engine of claim 19, wherein the at least one bearing of the crankshaft bearing includes an eccentric bearing intended to support at least one balance weight.

22. A method of communicating lubricant within an internal combustion engine, the method comprising:

communicating at least a first portion of the lubricant to a crankshaft bearing by way of at least one first channel;

further communicating at least a second portion of the lubricant from the crankshaft bearing through at least one second channel within the crankshaft to an eccentric bearing, wherein the eccentric bearing is configured for supporting at least a portion of a balance weight.

23. The method of claim 22, further comprising:

pumping the lubricant by way of a pump, and

wherein the first channel includes an internal passage through a camshaft.